IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl. No. : 10/606,436 Confirmation No. 6928
Applicant : Steven M. Burns et al.
Filed : June 25, 2003
TC/A.U. : 1742
Examiner : Sikyin Ip

Docket No. : 085-10940 (03-325)
Customer No. : 52237

RESPONSE TO NON-COMPLIANT APPEAL BRIEF

Sir:

This is in response to the Notification of Non-Compliant Appeal Brief mailed July 25, 2007.

A review of the Appeal Brief which was filed on June 21, 2007, a copy of which is attached hereto, contains the following statement at the top of page 2:

"Claims 24-27 and 30-33 are withdrawn from consideration as being directed to a non-elected invention."

Thus, the Examiner is wrong when he says that the status of all claims, particularly claims 24-27, have not been identified.

The Examiner is invited to allow the application for the reasons set forth in Appellants' fully compliant Appeal Brief.

Respectfully submitted,

Steven M. Burns et al.

By _____
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I, **Karen M. Gill**, hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on **August 7, 2007**.

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APPEAL BRIEF

Sir:

This is an appeal to the Board of Patent Appeals and Interferences from the final rejection of claims 1 - 23, 28 and 29, dated January 25, 2007, made by the Primary Examiner in Tech Center/Art Unit 1742.

REAL PARTY IN INTEREST

The real party in interest is United Technologies Corporation of Hartford, Connecticut.

RELATED APPEALS AND INTERFERENCES

There are no other prior and pending appeals, interferences or judicial proceedings known to Appellants, Appellants' assignee, or Appellants' legal representative which may be related to, directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1 - 33 are pending in the application. Claims 1 - 23, 28, and 29 stand rejected and are on appeal. Appendix A contains the claims on appeal.

Claims 24 - 27 and 30 - 33 are withdrawn from consideration as being directed to a non-elected invention.

STATUS OF AMENDMENTS

No amendment was filed after the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 on appeal relates to a method for heat treating at least one workpiece. The method comprises the steps of: cleaning a furnace to be used during said heat treating method; said cleaning step comprising injecting a gas at a workpiece center location and applying heat; and diffusion heat treating said at least one workpiece in a gas atmosphere with said gas being injected at said workpiece center location. See page 2 of the specification, lines 18 - 27.

As set forth in claim 2, the cleaning method comprises injecting said gas into said furnace at said workpiece center location at a flow rate sufficient to create a pressure differential which carries contaminants away from said workpiece center location toward an exit. See page 5, last line to page 6, line 12 of the specification.

As set forth in claim 3, the gas injecting step of claim 2 comprises injecting said gas at a partial pressure of at least 0.8 Torr. See page 4 of the specification, lines 17 - 24.

As set forth in claim 4, the gas injecting step of claim 2 comprises injecting said gas into said furnace at a rate of 30 liters per minute to 70 liters per minute. See page 6 of the specification, lines 7 - 9.

As set forth in claim 5, the gas injecting step of claim 2 comprises injecting an inert gas. See page 2 of the specification, lines 21 - 22.

As set forth in claim 6, the gas injecting step of claim 2 comprises injecting argon. See page 2 of the specification, line 22.

As set forth in claim 7, the gas injecting step of claim 2 comprises injecting a reducing gas. See page 2 of the specification, line 22.

As set forth in claim 8, the diffusion heat treatment step of claim 1 is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours. See page 6 of the specification, lines 27 - 30.

As set forth in claim 9, the diffusion heat treatment step of claim 1 comprises injecting said gas into said workpiece center location at a rate sufficient to carry away contaminants in said workpiece but less than a rate at which a door to said furnace is caused to open. See page 5, last line to page 6, line 7 of the specification.

As set forth in claim 10, which depends from claim 9, the diffusion heat treatment step comprises injecting said gas into said workpiece center location at a partial pressure of at least 0.8 Torr. See page 6 of the specification, lines 9 - 12.

As set forth in claim 11, the method includes said gas being injected into said furnace at a flow rate of 30 liters per minute to 70 liters per minute. See page 6 of the specification, lines 7 - 9.

As set forth in claim 12, which depends from claim 9, said diffusion heat treatment comprises injecting an inert gas. See page 2 of the specification, line 25.

As set forth in claim 13, which depends from claim 9, said diffusion treatment comprises injecting argon. See page 6 of the specification, lines 16 - 20.

As set forth in claim 14, which depends from claim 9, said diffusion heat treatment comprises injecting a reducing gas. See page 2 of the specification, line 25.

Claim 15 is an independent claim and relates to a method for providing at least one workpiece having a coating. The method comprises the steps of: diffusion heat treating said at least one workpiece in gas atmosphere within a furnace with said gas being injected at a workpiece center location; removing said workpiece from said furnace; and subjecting said coated workpiece to a surface finishing operation. See page 2 of the specification, lines 10 - 12 and lines 18 - 28.

As set forth in claim 16, which depends from claim 15, said diffusion heat treatment step is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours. See page 6 of the specification, lines 27 - 30.

As set forth in claim 17, which depends from claim 15, said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a rate sufficient to carry away contaminants in said workpiece but less than a rate at which a door to said furnace is caused to open. See page 5, last line to page 6, lines 7 of the specification.

As set forth in claim 18, which depends from claim 17, said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a partial pressure of at least 0.8 Torr. See page 6 of the specification, lines 13 - 26.

As set forth in claim 19, which depends from claim 17, said gas is injected into said furnace at a flow rate of 30 liter per minute to 70 liters per minute. See page 6 of the specification, lines 20 - 23.

As set forth in claim 20, which depends from claim 15, said surface finishing step comprising subjecting said coated workpiece to a peening operation. See page 7 of the specification, lines 1 - 5.

As set forth in claim 21, which depends from claim 15, said diffusion heat treating step comprises injecting an inert gas into said workpiece center location. See page 7 of the specification, lines 20 - 25.

As set forth in claim 22, which depends from claim 15, said diffusion heat treating step comprises injecting argon into said workpiece center location. See page 7 of the specification, lines 20 - 25.

As set forth in claim 23, which depends from claim 15, said diffusion heat treating step comprises injecting a reducing gas into said workpiece center location. See page 6 of the specification, lines 16 - 20.

As set forth in claim 28, which depends from claim 1, said injecting step comprises providing a manifold within a chamber of said furnace for delivering gas to a center of the workpiece location area. See FIG. 1 of the drawings and page 4 of the specification, lines 32 - 34.

As set forth in claim 29, which depends from 1, said cleaning step comprises heating said furnace to a temperature which is 200 to 300 degrees Fahrenheit greater than a temperature at which said diffusion heat treating step is being performed. See page 5 of the specification, lines 30 - 34.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are as follows:

(1) the rejection of claims 15 - 23 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,042,898 to Burns et al.; and

(2) the rejection of claims 1 - 14, 28, and 29 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,042,898 to Burns et al. and further in view of Japanese Patent Publication No. 6-213,981 or Japanese Patent Publication No. 2003027209.

ARGUMENT

(A) Patentability of Independent Claim 15

With regard to the rejection of claims 15 - 23 on obviousness grounds over Burns et al., the rejection is not well founded. Appellants have found that cleaning of the diffusion heat treatment environment plays a significant role in coating ductility and a coating's final quality acceptability. As noted in paragraph 0015 of the specification, previous practice within the coating industry to correct a contaminated furnace has been to ensure the furnace is adequately free from vacuum leaks and perform a vacuum burn out heat treat cycle a few hundred degrees higher than the highest temperature production heat treat cycle previously used within the furnace. Appellants have found that this still leads to the production of less than desirable coatings. Appellants have found that improved coatings can be obtained begins with cleaning a furnace to be used in the diffusion heat treatment using a heat treat cycle with a gas being injected at the center of the work piece location area. It is this aspect of the claimed invention which is neither taught nor suggested in the cited and applied Burns et al. patent.

Independent claim 15 is allowable because Burns et al. does not teach or suggest the step of "diffusion heat treating said at least one workpiece in gas atmosphere within a furnace with said gas being injected at a workpiece center location."

The Examiner contends that cleaning the workpiece at any step is contemplated and within the ambit of ordinary skill artisan when the workpiece is contaminated. Even if this statement were true, it does not address the method step which is missing from Burns et al. - namely, performing the diffusion heat treating step with the gas being injected at a workpiece center location. Thus, Appellants submit that the Examiner has not met his burden of making out a *prima facie* case of obviousness.

The rejection of record lacks any statement as to where the missing claimed subject matter can be found in the prior art and why one of ordinary skill in the art would modify Burns et al. so that the gas is injected at the workpiece center location. Certainly, Burns et al. makes no such suggestion. As stated in MPEP 2142,

> "[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference …. Finally, the prior art reference … must teach or suggest all the claim limitations."

The Examiner has not complied with these requirements and thus has failed to make out the required *prima facie* case of obviousness.

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has

done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (BPAI 1985). The Examiner in this instance has not pointed out where the missing subject matter is suggested in any piece of prior art and has not presented any line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of Burns et al.

The mere fact that a reference can be modified does not render the modification obvious unless the prior art suggests the desirability of the modification. See *In re Mills*, 916 F.2d 680 682, 15 USPQ2d 1430, 1432 (Fed. Cir. 1990).

It should also be noted that the level of skill in the art cannot be relied upon to provide the suggestion to modify a reference. See *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999). Also see MPEP 2143.01. Thus, the Examiner's reliance on his conclusory statement about cleaning workpieces is misplaced and does not form a basis for providing the required suggestion.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 492 F.2d 981, 180 USPQ 580 (CCPA 1974). Also see MPEP 2143.03. As noted above, not all of the limitations of claim 15 are taught or suggested in the cited prior art.

For these reasons, the rejection of claim 15 on obviousness grounds fails and should be withdrawn.

(B) Patentability of Claims 16 - 23

Claims 16 - 23 are allowable for the same reasons as claim 15 as well as on their own accord. For example, Burns et al. does not teach the diffusion heat treatment temperature of claim 16. It is entirely silent on the subject. Still further, Burns et al. does not teach or suggest the gas flow rate of claim 17; the partial pressure of claim 18; the gas flow rate of claim 19; the step of injecting an inert gas into said workpiece center location of claim 21; the step of injecting argon into said workpiece center location of claim 22; and the step of injecting a reducing gas into said workpiece center location of claim 23.

The rejection of claims 16 - 23 is further defective because the Examiner has not made out a *prima facie* case of obviousness for the reasons previously discussed. The Examiner has not made any statement as to why one of ordinary skill in the art would modify Burns et al. to perform any of the method steps set forth in claims 16 - 23. The Examiner does not even make an effort to address each of the claims and the limitations contained therein.

The Examiner's comment about the gas flow rate is duly noted; however, claim 19, which is directed to the gas flow rate, depends from claim 17 and thus incorporates same. The rejection made by the Examiner does not even begin to talk about the step of "injecting said gas into said workpiece center location at a rate sufficient to carry away contaminants in said workpiece but less than a rate which a door to said furnace is caused to open." Nowhere does the Examiner address where this method step is taught or suggested in the cited prior art. He can't because it is not taught or suggested by Burns et al.

(C) Patentability of Independent Claim 1

With respect to the rejection of independent claim 1 on obviousness grounds, the foregoing comments about Burns et al. and its deficiencies are equally applicable here and are incorporated by reference. Still further, while Burns et al. talks about cleaning, it does not teach or suggest a cleaning step which comprises "injecting a gas at a workpiece center location and applying heat."

The secondary references applied by the Examiner do not cure the deficiencies of Burns et al. Japanese patent document 62139810 relates to a method and apparatus for cleaning the inside of a tempering furnace. It does not teach or suggest any cleaning method comprising injecting a gas at a workpiece center location and applying heat. It most certainly does not teach or suggest a diffusion heat treatment of a workpiece where gas is being injected at the workpiece center location. Thus, even if this reference were somehow properly combinable with Burns et al., there is nothing which teaches or suggests the invention as claimed in claim 1.

Japanese patent document 2003027209 relates to a surface hardening treatment method, i.e. carbonization, of the inner holes of steel products. With respect to cleaning, the English abstract only says that the gas transport pipe and fixing appliance are cleaned and dried and then installed in the prescribed positions in the heating space. The fact that this reference says that the pipe and appliance are cleaned and dried *and then (emphasis added) installed* in the prescribed positions demonstrates that it does not teach or suggest the claimed invention. There is absolutely nothing in this document which teaches performing a furnace cleaning step by injecting a gas at a workpiece center location and applying heat. In fact, the

reference does not talk about cleaning the furnace at all. Thus, this patent document also fails to teach or suggest a cleaning method comprising injecting a gas at a workpiece center location and applying heat and diffusion heat treating the at least one workpiece in a gas atmosphere with the gas being injected at the workpiece center location. It should also be noted that nowhere in the cited document does it say that the gas is injected at the workpiece center location. The gas is clearly injected into the interior of the workpiece, but there is no disclosure, teaching, or suggestion that the gas is injected at the workpiece center location. Thus, even if this reference were properly combinable with Burns et al., there still is no teaching of the subject matter of claim 1.

Again, it is submitted that the Examiner has not met his burden of making a *prima facie* case of obviousness. Since none of the references teaches or suggests the claimed cleaning and diffusion heat treating steps, the subject matter of claim 1 is neither taught nor suggested by the proposed combination of references. Therefore, claim 1 is allowable. As stated above, to establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.

(D) Patentability of Claims 2 - 13, 28, and 29

Claims 2 - 13 are allowable for the same reasons as claim 1 and further on their own accord. For example, none of the cited and applied references teach or suggest the flow rate of claim 2; the partial pressure of claim 3; the gas flow rate of claims 4 and 11; the diffusion heat treatment temperature range of claim 8; and/or the injecting steps of claims 9 and 10. The Examiner does address in the rejection where the subject matter

of claims 2 - 13 can be found in the cited and applied references. The rejection is an impermissible shotgun rejection and fatally flawed.

With respect to claim 28, none of the cited and applied references teach or suggest providing a manifold within a chamber of the furnace. Thus, none of the cited and applied references could possibly teach or suggest the subject matter of claim 28.

As for claim 29, the Examiner ignores the fact that there is no disclosure that the furnace in Japanese patent document no. 62139810 is used for a diffusion heat treatment. Given this fact, how is it possible that this reference could teach heating the furnace to a temperature which is 200 to 300 degrees Fahrenheit greater than a temperature at which the diffusion heat treating step is being performed? The answer is that it is not possible. The reference is totally silent on this subject and could not provide the requisite suggestion or motivation necessary to modify Burns et al. because it performs a tempering process, not a diffusion heat treatment process.

(E) Response to the Examiner's Arguments

With respect to the Examiner's comments on page 4 of the office action about the teachings of JP 200327209, it has been pointed out to the Examiner that the drawing in this reference is not a blueprint. There is no written disclosure that the gas is transported to the center of the workpiece. The Examiner's contention that the gas is transported to the center of the workpiece is speculation based on a drawing which is not drawn to scale.

With respect to the Examiner's comments about Burns et al. in the paragraph bridging pages 4 and 5 of the office action,

Burns et al. teaches that as part of an ionized gas stream cleaning process, one would cause a gas to flow into a vacuum chamber. There is absolutely nothing in Burns which teaches performing a diffusion heat treating step with the gas being injected *at* a workpiece center location. Undoubtedly a turbine blade has a center, but this is not a teaching of what is being claimed. As for the Examiner's comment about the lack of factual evidence that injecting gas only at workpiece center location possesses unexpected results, the comment evidences a lack of understanding of the relevant law of obviousness. First, applicants need not show unexpected results until such time as the Examiner has made a *prima facie* case of obviousness, which the Examiner has not done. Second, the whole premise of this case is that one gets an improved result from injecting gas at the workpiece center location. Thus, Appellants have already provided evidence of an unexpected result obtained in an unexpected way.

With regard to the first full paragraph on page 5 of the office action, the temperature in column 3, lines 33 - 40 is a cleaning temperature, not a diffusion heat treatment temperature.

With respect to the Examiner's comments in the second full paragraph on page 5 of the office action, the Examiner still has not pointed out where all the features set forth in the claim can be found in the reference(s). As for the unexpected results argument, please see the above comments concerning same. They are equally applicable here.

With respect to the Examiner's argument in the third full paragraph on page 5 of the office action, Appellants do not have to show criticality until such time as the Examiner has made out a *prima facie* case of obviousness. Since the Examiner has not

done that for the reasons stated above, the Examiner's comments are not relevant and neither is the *Boesch* case.

CONCLUSION

For the foregoing reasons, the Board is hereby requested to reverse the rejection of claims 1 - 23, 28, and 29 and remand the application to the Primary Examiner for allowance and issuance.

FEES

The Director is hereby authorized to charge the Appeal Brief Fee of $500.00 to Deposit Account No. 21 - 0279. Should the Director determine that an additional fee is due, he is hereby authorized to charge said fee to said Deposit Account.

Respectfully submitted,

Steven M. Burns et al.

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Date: June 19, 2007

I, Karen M. Gill, hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on June 19, 2007.

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CLAIMS ON APPEAL - APPENDIX A

1. A method for heat treating at least one workpiece comprising the steps of:

cleaning a furnace to be used during said heat treating method;

said cleaning step comprising injecting a gas at a workpiece center location and applying heat; and

diffusion heat treating said at least one workpiece in a gas atmosphere with said gas being injected at said workpiece center location.

2. A method according to claim 1, wherein said cleaning method comprises injecting said gas into said furnace at said workpiece center location at a flow rate sufficient to create a pressure differential which carries contaminants away from said workpiece center location toward an exit.

3. A method according to claim 2, wherein said gas injecting step comprises injecting said gas at a partial pressure of at least 0.8 Torr.

4. A method according to claim 2, wherein said gas injecting step comprises injecting said gas into said furnace at a rate of 30 liters per minute to 70 liters per minute.

5. A method according to claim 2, wherein said gas injecting step comprises injecting an inert gas.

6. A method according to claim 2, wherein said gas injecting step comprises injecting argon.

7. A method according to claim 2, wherein said gas injecting step comprises injecting a reducing gas.

8. A method according to claim 1, wherein said diffusion heat treatment step is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours.

9. A method according to claim 1, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a rate sufficient to carry away contaminants in said workpiece but less than a rate at which a door to said furnace is caused to open.

10. A method according to claim 9, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a partial pressure of at least 0.8 Torr.

11. A method according to claim 9, wherein said gas is injected into said furnace at a flow rate of 30 liters per minute to 70 liters per minute.

12. A method according to claim 9, wherein said diffusion heat treatment comprises injecting an inert gas.

13. A method according to claim 9, wherein said diffusion treatment comprises injecting argon.

14. A method according to claim 9, wherein said diffusion heat treatment comprises injecting a reducing gas.

15. A method for providing at least one workpiece having a coating comprising the steps of:

diffusion heat treating said at least one workpiece in gas atmosphere within a furnace with said gas being injected at a workpiece center location;

removing said workpiece from said furnace; and

subjecting said coated workpiece to a surface finishing operation.

16. A method according to claim 15, wherein said diffusion heat treatment step is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours.

17. A method according to claim 15, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a rate sufficient to carry away contaminants

in said workpiece but less than a rate at which a door to said furnace is caused to open.

18. A method according to claim 17, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a partial pressure of at least 0.8 Torr.

19. A method according to claim 17, wherein said gas is injected into said furnace at a flow rate of 30 liter per minute to 70 liters per minute.

20. A method according to claim 15, wherein said surface finishing step comprising subjecting said coated workpiece to a peening operation.

21. A method according to claim 15, wherein said diffusion heat treating step comprises injecting an inert gas into said workpiece center location.

22. A method according to claim 15, wherein said diffusion heat treating step comprises injecting argon into said workpiece center location.

23. A method according to claim 15, wherein said diffusion heat treating step comprises injecting a reducing gas into said workpiece center location.

28. A method according to claim 1, wherein said injecting step comprises providing a manifold within a chamber of said furnace for delivering gas to a center of the workpiece location area.

29. A method according to claim 1, wherein said cleaning step comprises heating said furnace to a temperature which is 200 to 300 degrees Fahrenheit greater than a temperature at which said diffusion heat treating step is being performed.

EVIDENCE - APPENDIX B

NOT APPLICABLE

RELATED PROCEEDINGS - APPENDIX C

NOT APPLICABLE